

UNDERWATER BRIDGE INSPECTION REPORT

STRUCTURE NO. 55031

OVER THE

SOUTH BRANCH MIDDLE FORK ZUMBRO RIVER

DISTRICT 6 – OLMSTEAD COUNTY



PREPARED FOR THE

MINNESOTA DEPARTMENT OF TRANSPORTATION

BY

COLLINS ENGINEERS, INC.

JOB NO. 5221

MINNESOTA DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

REPORT SUMMARY:

The substructure units inspected at Bridge No. 55031, the North and South Piers, were found to be in good condition with no defects of structural significance. The channel bottom around the substructure units was well established and appeared to be in stable condition with no evidence of significant scour. There were heavy accumulations of timber drift at both of the piers.

INSPECTION FINDINGS:

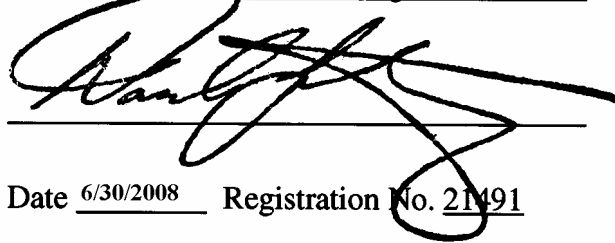
- (A) The steel piles at both piers exhibited no coating failure or corrosion below water; however, from the pile cap down 5 feet, there was up to 25 percent coating failure and light surface corrosion.
- (B) A scour depression 4 feet in radius by 2 feet in depth was observed at the upstream pile of the South Pier.
- (C) Heavy accumulations of timber debris consisting of logs and branches of up to 2 feet in diameter were observed on the north side of both piers extending from the channel bottom to 5 feet above the waterline. The timber drift accumulates on northerly side of piers due to a southeasterly flow direction at bridge.

RECOMMENDATIONS:

- (A) Remove heavy accumulations of timber debris at both piers, so they do not adversely affect the piers and/or the surrounding channel bottom.
- (B) Reinspect the submerged substructure units at the normal maximum recommended (NBIS) interval of five (5) years.

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

Daniel G. Stromberg

A large, stylized handwritten signature in black ink, appearing to read 'Dan G. Stromberg', is written over a horizontal line.

Date 6/30/2008 Registration No. 21491

Respectfully submitted,

COLLINS ENGINEERS, INC.

A large, stylized handwritten signature in black ink, appearing to read 'Dan G. Stromberg', is written over a horizontal line.

Daniel G. Stromberg
Registered Professional
Engineer, State of Minnesota

MINNESOTA DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

1. BRIDGE DATA

Bridge Number: 55031

Feature Crossed: South Branch Middle Fork Zumbro River

Feature Carried: West Frontage Road on West Side of US 52 SB

Location: District 6 – Olmstead County

Bridge Description: The bridge superstructure consists of three spans of cast-in-place reinforced concrete structure. The superstructure is supported by two reinforced concrete abutments and two cast-in-place concrete, steel shell pile bent piers. The piers are designated as the North Pier and South Pier.

2. INSPECTION DATA

Professional Engineer Diver: Daniel G. Stromberg, P.E., S.E.

Dive Team: Clayton G. Brookins, Valerie Roustan

Date: October 24, 2007

Weather Conditions: Sunny, 58° F

Underwater Visibility: 0.5 feet

Waterway Velocity: 1.5 f.p.s

3. SUBSTRUCTURE INSPECTION DATA

Substructure Inspected: North and South Piers.

General Shape: The pier caps are constructed of reinforced concrete with an oblong rectangular shape having rounded noses, and are supported by a single row of eight steel shell piles.

Maximum Water Depth at Substructure Inspected: Approximately 5.6 feet.

4. WATERLINE DATUM

Water Level Reference: Top of pier cap on the upstream end of South Pier.

Water Surface: The waterline was approximately 12.3 feet below the reference.
Assumed Waterline Elevation 87.7.

5. NBIS CODING INFORMATION (Minnesota specific codes are used for 92B and 113)

Item 60: Substructure: Code 7

Item 61: Channel and Channel Protection: Code 5

Item 92B: Underwater Inspection: Code B/10/07

Item 113: Scour Critical Bridges: Code G/07

Bridge is scour critical because abutment or pier foundation is rated as unstable due to observed scour at bridge site.

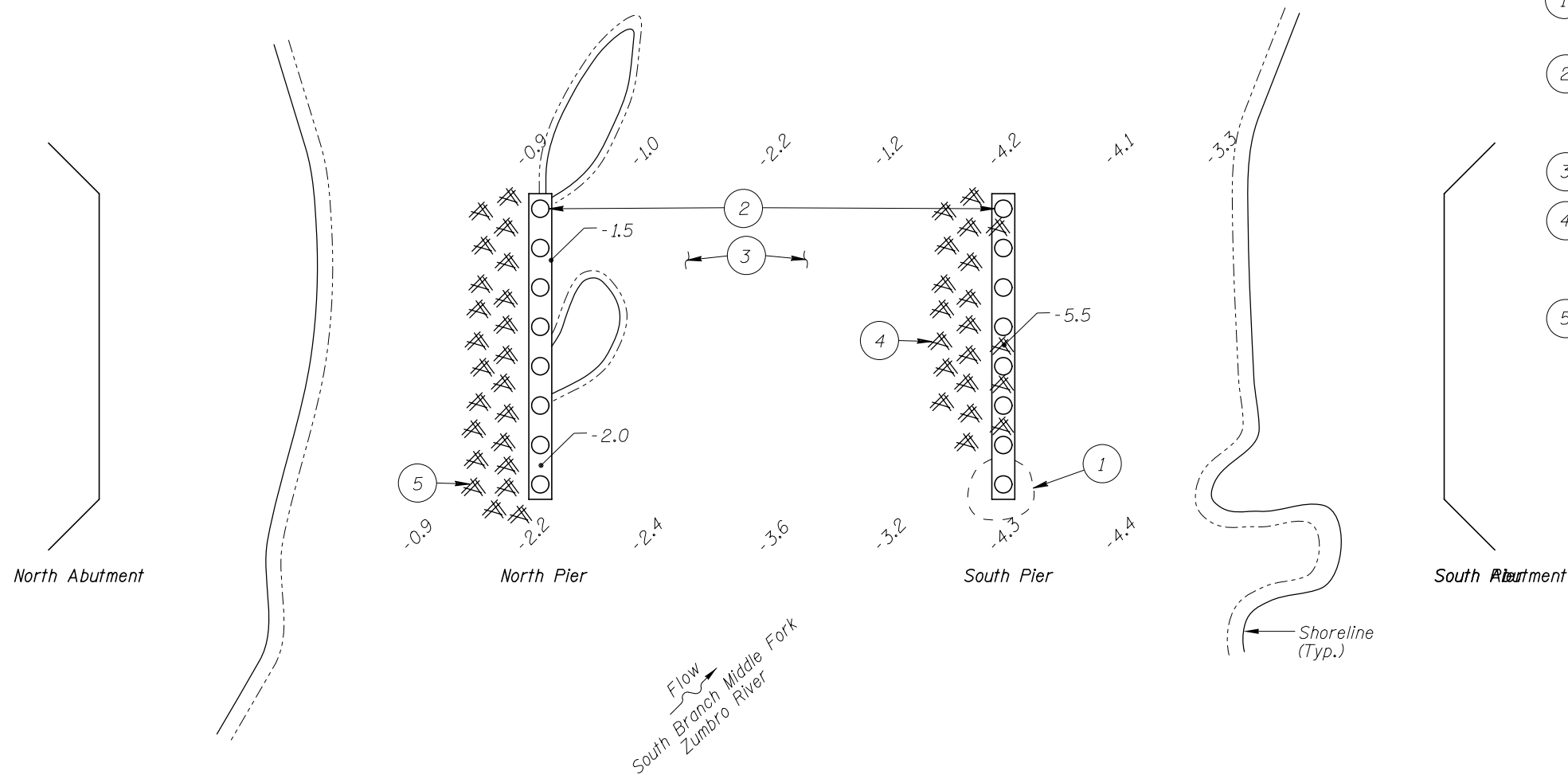
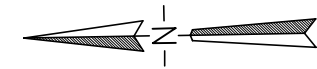
 Yes X No



Photograph 1. View of the North Pier 1, Looking Southeast.



Photograph 2. View of the South Pier, Looking North.



INSPECTION NOTES:

- 1 A scour depression measuring 4 feet radially by 2 feet deep was observed at the upstream pile of the south pier.
- 2 Steel piles at both piers show no coating failure or corrosion below water; however, from the pile cap down 5 feet, there was up to 25 percent coating failure and minor surface corrosion.
- 3 The channel bottom consisted of silty sand with 1 foot maximum probe rod penetration.
- 4 A heavy accumulation of timber debris consisting of 1.5 feet diameter and smaller logs and branches was observed at the north side of the south pier extending from the channel bottom to 5 feet above the waterline.
- 5 A heavy accumulation of timber debris consisting of 2 feet diameter and smaller logs and branches was observed at the north side of the north pier extending from the channel bottom to 5 feet above the waterline.

GENERAL NOTES:

1. The North and South Piers were inspected underwater.
2. At the time of inspection, on August 18, 2007, the waterline was located approximately 12.3 feet below the top of pier cap of the upstream end of South Pier. Due to the unavailability of design plans, the pier cap elevation is assumed to be 100.0 feet. This corresponds to waterline elevation of 87.7 feet.
3. Soundings indicate the water depth at the time of inspection and are measured in feet.
4. Soundings were taken parallel to the bridge at 1/4 point intervals between the substructure units as well as around the pier structures.

Legend

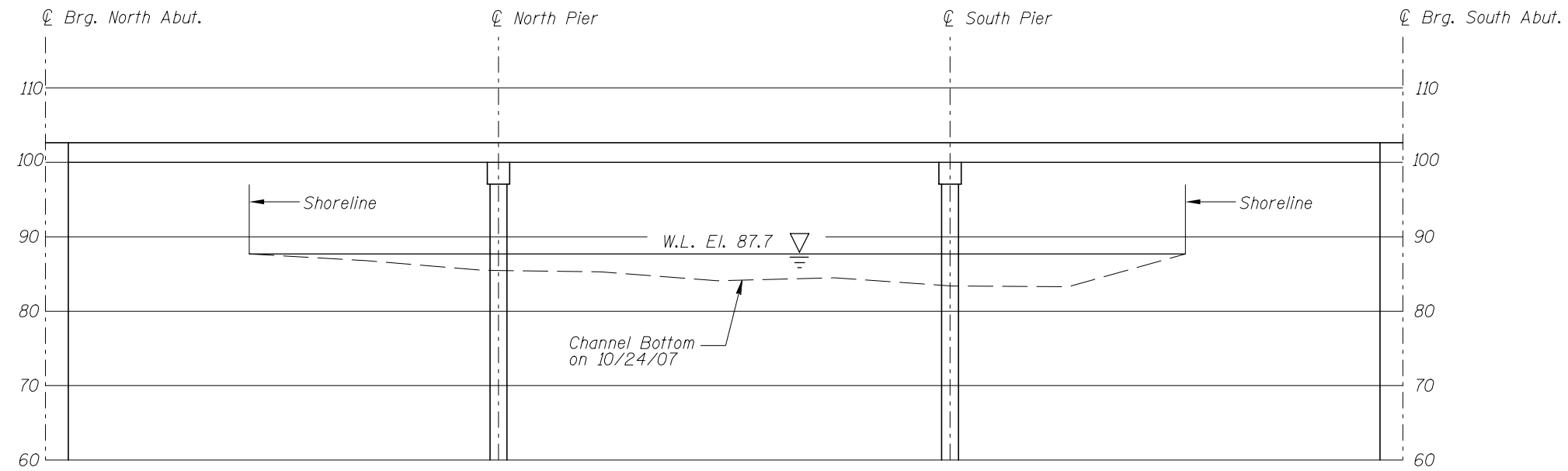
- 0.4 Sounding Depth (10/24/07)
- Timber Debris
- Scour Depression

MINNESOTA DEPARTMENT OF TRANSPORTATION UNDERWATER BRIDGE INSPECTION

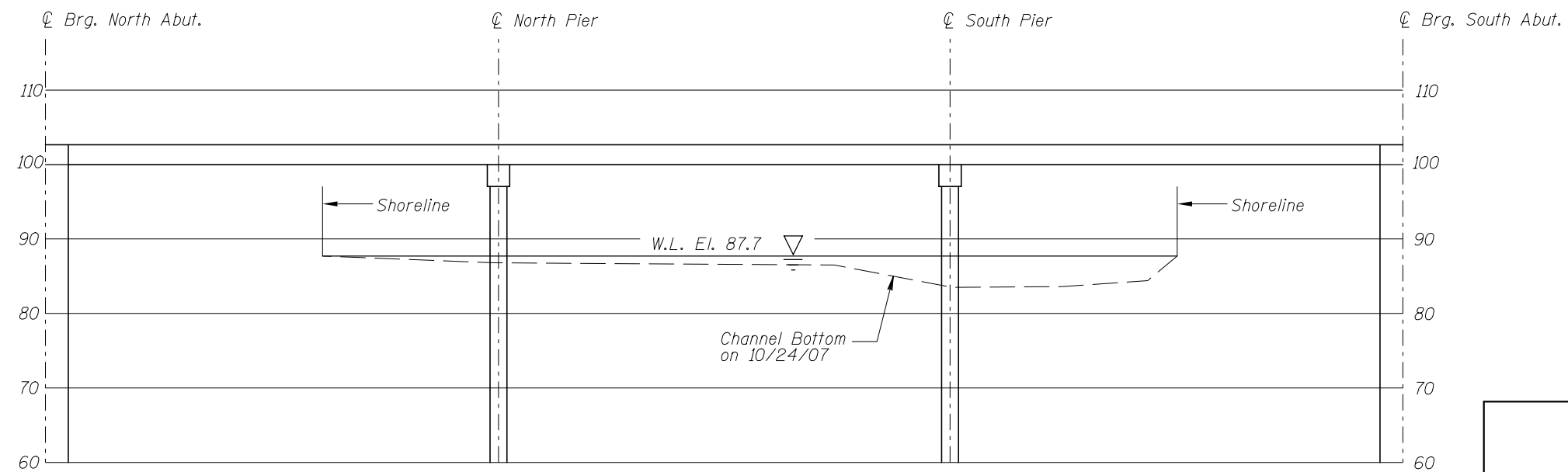
STRUCTURE NO. 55031
OVER THE SOUTH BRANCH MIDDLE FORK ZUMBRO RIVER
DISTRICT 6, OLMSTEAD COUNTY

INSPECTION AND SOUNDING PLAN

Drawn By: CAI	COLLINS ENGINEERS	123 North Wacker Drive Suite 300 Chicago, IL 60606 (312) 704-9300 www.collinsengr.com	Date: OCT. 2007
Checked By: VR			Scale: NTS
Code: 522155031			Figure No.: I



UPSTREAM FASCIA PROFILE



DOWNSTREAM FASCIA PROFILE

Note:
Refer to Figure 1 for General Notes.

MINNESOTA DEPARTMENT OF TRANSPORTATION UNDERWATER BRIDGE INSPECTION		
STRUCTURE NO. 5503I OVER THE SOUTH BRANCH MIDDLE FORK ZUMBRO RIVER DISTRICT 6, OLMTREAD COUNTY		
UPSTREAM AND DOWNSTREAM FASCIA PROFILES		
Drawn By: CAI	COLLINS ENGINEERS <small>123 North Wacker Drive Suite 300 Chicago, IL 60606 (312) 704-9300 www.collinsengr.com</small>	Date: OCT. 2007
Checked By: VR		Scale: 1"=20'
Code: 522I5503I		Figure No.: 2

MINNESOTA DEPARTMENT OF TRANSPORTATION
OFFICE OF BRIDGES AND STRUCTURES
DAILY DIVING REPORT

INSPECTORS: Collins Engineers, Inc. DATE: October 24, 2007

ON-SITE TEAM LEADER: Daniel G. Stromberg, P.E., S.E.

BRIDGE NO: 55031 WEATHER: Sunny, 58° F

WATERWAY CROSSED: South Branch Middle Fork Zumbro River

DIVING OPERATION: X SCUBA SURFACE SUPPLIED AIR
 OTHER

PERSONNEL: Clayton G. Brookins, Valerie Roustan

EQUIPMENT: Scuba, U/W Light, Scraper, Lead Line, Probe Rod, Camera

TIME IN WATER: 9:35 a.m.

TIME OUT OF WATER: 10:10 a.m.

WATERWAY DATA: VELOCITY 1.5 f.p.s

VISIBILITY 0.5 feet

DEPTH 5.5 feet maximum at South Pier

ELEMENTS INSPECTED: North and South Piers

REMARKS: The steel piles at both piers show no coating failure or corrosion below water. However, from the pile cap down 5 feet, there was up to 25 percent coating failure and light surface corrosion. A scour depression 4 feet in radius by 2 feet in depth was observed at the upstream pile of the South Pier. Heavy accumulations of timber debris consisting of logs and branches of up to 2 feet in diameter were observed on the north side (due to flow direction) of both piers extending from the channel bottom to 5 feet above the waterline.

FURTHER ACTION NEEDED: X YES NO

Remove heavy accumulations of timber debris at both piers, so they do not adversely affect the piers and/or the surrounding channel bottom.

Reinspect the submerged substructure units at the normal maximum recommended (NBIS) interval of five (5) years.

MINNESOTA DEPARTMENT OF TRANSPORTATION
OFFICE OF BRIDGES AND STRUCTURES

UNDERWATER INSPECTION CONDITION RATING FORM

BRIDGE NO. 55031
INSPECTORS Collins Engineers, Inc.
ON-SITE TEAM LEADER Daniel G. Stromberg, P.E., S.E.
WATERWAY CROSSED Zumbro River

INSPECTION DATE October 24, 2007
NOTE: USE ALL APPLICABLE CONDITION
DEFINITIONS AS DEFINED IN THE MINNESOTA
RECORDING AND CODING GUIDE INCLUDING
GENERAL, SUBSTRUCTURE, CHANNEL AND
PROTECTION, AND CULVERTS AND WALL
DEFINITIONS TO COMPLETE THIS FORM.

CONDITION RATING

UNIT REFERENCE NO.	UNIT DESCRIPTION	MAXIMUM DEPTH OF WATER	SUBSTRUCTURE						CHANNEL					GENERAL					
			PILING	COLUMNS, SHAFTS, OR FACES*	FOOTINGS	DISPLACEMENT	OTHER (BRACING)	OVERALL SUBSTRUCTURE CONDITION CODE*	SCOUR	EMBANKMENT EROSION	EMBANKMENT PROTECTION	OTHER (DRIFT/DEBRIS)	OVERALL CHANNEL & PROTECTION CONDITION	CONCRETE	STEEL	TIMBER	LOSS OF SECTION	PREVIOUS REPAIR OR MAINTENANCE	OTHER
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
	North Pier	5.5'	7	N	N	9	N	7	8	8	8	5	5	N	7	N	7	N	N
	South Pier	5.2'	7	N	N	9	N	7	8	8	8	5	5	N	7	N	7	N	N

*UNDERWATER PORTION ONLY

REMARKS: The steel piles at both piers show no coating failure or corrosion below water. However, from the pile cap down 5 feet, there was up to 25 percent coating failure and light surface corrosion. A scour depression 4 feet in radius by 2 feet in depth was observed at the upstream pile of the South Pier. Heavy accumulations of timber debris consisting of logs and branches of up to 2 feet in diameter were observed on the north side (due to flow direction) of both piers extending from the channel bottom to 5 feet above the waterline.

NOTES: ATTACH SKETCHES AS NEEDED, IDENTIFY REMARK BY REFERRING TO UNIT REFERENCE NO. AND REMARK NO.
USE GENERAL SECTION TO IDENTIFY OVERALL PRESENCE OF SPALLS, CRACKS, CORROSION, ETC.